

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today
(1) was not written for publication in a law journal and
(2) is not binding precedent of the Board.

Paper No. 16

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RAM S. NARANG and WILLIAM R. BURGER

Appeal No. 96-0515
Application 08/169,081¹

ON BRIEF

Before MARTIN, JERRY SMITH, and CARMICHAEL, Administrative
Patent Judges.

MARTIN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the
examiner's final rejection of claims 1-6 and 14 under 35

¹ Application for patent filed December 20, 1993.

U.S.C. § 103.² Claims 7-13 stand withdrawn from consideration as directed to a non-elected invention (final Office action at 2). No claims stand allowed. We reverse.

The invention relates to the use of a flexible porous member and a thermal setting adhesive to create a seal between a printhead and the housing of an inkjet printer cartridge which contains the ink supply. Referring to Figure 2, a porous member 36 is located between surface 26 of cartridge 10 and the printhead 14 (Spec. at 8, lines 5-11). As is also apparent from that figure, the porous member has a slot 35 therethrough for connecting one end of cartridge recess 30 (which receives ink from ink chamber 11 via outlet 16) to the interior end of the nozzle passage 37 in the printhead. As shown in Figure 4, prior to assembly of the cartridge and the printhead, surface 31 of porous member 36 (excluding slot 35) is provided with thermosetting adhesive layer 38, which is insoluble in components utilized in ink (Spec. at 7, lines 20-25). During assembly, the porous member is positioned against surface 26 of the cartridge and the temperature raised to

² A rejection of claim 14 under the second paragraph of § 112 was withdrawn in the Answer (at 1).

about 80EC to cause the adhesive 38 on surface 31 to adhere or tack thereto without the adhesive moving completely into the porous member (Spec. at 8, lines 5-8). The adhesive layer on the porous member also closes all of one side of recess 30 except for a small portion in alignment with slot 35 of the porous member, thereby forming a closed ink passageway from the cartridge chamber 11 to the printhead nozzle 37 (Spec. at 8, lines 11-14). The printhead 14 and bonded heat sink 24, as an assembly 46, are then aligned with and placed in contact with the porous member (Spec. at 9, lines 3-6). The cartridge housing 12 and the attached printhead and heat sink assembly are cured in an oven, curing the thermosetting adhesive material and causing it to migrate or diffuse through the pores of the porous member 36 and establish good contact with the printhead 14, thereby creating a direct bond between the cartridge housing wall 25 and the printhead 14 and making the porous member solid and impervious to air and ink (Spec. at 9, line 29 to p.10, line 4). The printhead is also attached to the cartridge by means of stake pins 40, whose ends are staked to preform pin heads 41 (Spec. at 9, lines 16-18).

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Of the two independent claims before us (i.e., claims 1 and 14), Appellants' brief specifically addresses only claim 1, which is the narrower of the two claims. We will begin our analysis with claim 14, the broader claim, which reads as follows:

14. In an improved thermal ink jet printer which includes a cartridge having a supply of ink therein, said cartridge being in ink flow communication with nozzles of a printhead, the improvement comprises an interface between the printhead and the cartridge which is sealed by a flexible porous member having a slot therethrough and having first and second surfaces coated with a thermal setting adhesive which fills all pores of said member, the porous member being impervious to air and ink[,] the porous member further providing a direct bonding between the cartridge and printhead.

The examiner relies on the following references:

Baker et al. (Baker)	4,771,295	Sep. 13, 1988
Kneezel et al. (Kneezel)	4,864,329	Sep. 5, 1989

Claims 1-6 and 14 stand rejected under 35 U.S.C. § 103 as unpatentable over Baker in view of Kneezel.

Figure 2 of Baker shows a substrate member or interface seal 102 whose top surface is bonded to the surface 100 of pen body 10 by an adhesive 114, 116, and 118, which is simply described as a "suitable adhesive" (col. 4, lines 3-8). The

bottom surface of substrate member 102 is bonded to the upper surface of a nozzle plate 104 by an adhesive 106, which is advantageously selected to be a polymer material such as one of the polymer materials sold by E.I. Dupont's under the trade names RISTON and VACREL (col. 3, lines 47-52). The material of which substrate member 102 is formed is not disclosed. The substrate member includes passages 108, 110, and 112 for allowing ink to pass from ink chambers 88, 90, and 92 in pen body 10 to the orifices in the nozzle plate (col. 3, lines 52-58).

In comparing the claims to Baker, the examiner reads the claimed cartridge on pen body 10, the claimed printhead on nozzle plate 104, and the claimed "member" having a slot therethrough on substrate member 102, having passages 108, 110, and 112 (final Office action at 4). The examiner concedes that Baker's substrate member is not described as being porous or flexible or as containing a thermal setting adhesive in its pores (id.). For these teachings, the examiner turns to Kneezel, which discloses a method of providing inkjet printheads with ink filters by laminating a substantially flat wafer-size filter to an ink inlet wafer or

substrate containing a plurality of ink channel plates (col. 2, lines 28-32). Figure 1 shows a filter 14 and a silicon wafer 16 having a plurality of channel plates 31 formed therein (col. 3, lines 51-54; col. 4, lines 41-44). Referring to Figure 2, each channel plate 31 has an ink fill hole 25 (col. 3, lines 56-60). As shown in Figure 7, the pores 24 of filter 14 are much smaller than the fill holes 25 in each channel plate 31. Filter 14 is adhered to wafer 16 as follows (col. 4, lines 45-68):

Basically, the method of bonding the filter 14 to the channel wafer 16 is accomplished by coating a flexible substrate (not shown) with a relatively thin uniform layer of adhesive having an intermediate non-tacky curing stage with a shelf life of around one month for ease of alignment of parts and ease of storage of the components having the adhesive thereon. About half of the adhesive layer on the flexible substrate is transferred to the surface of [sic] 33 of the wafer within a predetermined time of the coating of the flexible substrate by placing it in contact therewith and applying a predetermined temperature and pressure to the flexible substrate prior to peeling it from the channel wafer. This causes the adhesive to fail cohesively in the liquid state, assuring that about half of the thickness of the adhesive layer stays with the flexible substrate and is discarded therewith, leaving a very thin uniform layer of adhesive on the channel wafer surface 33 without permitting the adhesive to flow into the fill hole edges. The transferred adhesive layer remaining on the wafer surface enters in[to] an intermediate, non-tacky curing stage to assist in subsequent alignment of the filter. The filter

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14 and the etch[ed] channel wafer 16 are cured to complete the bonding of the filter thereto.

Filter 14 may be 1-100 microns thick, may be electroformed, and must be a plateable material that is corrosion resistant to ink, diceable, and robust enough to handle, such as nickel (col. 5, lines 1-11). In addition to filtering out contamination from the ink and ink supply system, the filter prevents dirt and other debris from entering the relatively large inlets during printhead assembly (col. 5, lines 53-56). The filter alternatively may be a woven, mesh type filter or, preferably, a membrane filter produced, for example, by electroforming or other photolithographically defineable processes (col. 7, lines 33-36). The examiner argues that

it would have been obvious . . . to incorporate a flexible porous member having an intermediate no[n]-tacky curing stage as taught by Kneezel et al. as a substrate into the teaching of Baker et al. for the purpose of achieving adhesive flowing into the pores to form a bonding process between the ink chamber wall and the printhead. [Final Office action at 5.]

We agree with Appellants (Brief at 11-12) that the rejection must fail for lack of motivation to combine the teachings of Baker and Kneezel in the manner proposed by the examiner. Obviousness cannot be established by combining the

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teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination. In re Bond, 910 F.2d 831, 834, 15 USPQ2d 1566, 1568 (Fed. Cir. 1990). The examiner has not satisfactorily explained, and it is not apparent to us, why the artisan, without using hindsight based on Appellants' application, would have desired to replace Baker's substrate member 102, which does not perform any filtering whatsoever, with Kneezel's filter 14, which does, especially since Baker's pen body 10 already includes three ink filters 36, 38, and 40, which are formed of stainless steel wire mesh and serve to filter out air bubbles and solid particles (col. 2, lines 36-43).

For the foregoing reason, the rejection of claim 14 under 35 U.S.C. § 103 as unpatentable over Baker in view of Kneezel is

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reversed, as is the § 103 rejection of narrower independent
claim 1 and its dependent claims 2-5.

REVERSED

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JOHN C. MARTIN)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
JERRY SMITH)	
Administrative Patent Judge)	APPEALS AND
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)	INTERFERENCES
)	
JAMES T. CARMICHAEL)	
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DYM

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